



SAFETY DATA SHEET

Aluminium powder alloys for selective laser melting with
Nickel > 1%

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

Product name : Aluminium powder alloys for selective laser melting with Nickel > 1%
Product code : Not available.
Product type : Solid.
Other means of identification : Constellium Alu. AM Powder - Ahead@ HT1 {20-63 µm ; 20-105 µm ; 63-105 µm ; >20 µm ; >63 µm}

1.2 Relevant identified uses of the substance or mixture and uses advised against

Product use : Aluminium Alloy Powder
Area of application : Industrial applications.

Uses advised against

None identified.

1.3 Details of the supplier of the safety data sheet

Constellium International
Washington Plaza
40-44, rue Washington
75008 Paris
France

Telephone no.: +33 (0)1 73 01 46 00

<https://www.constellium.com/contact>

e-mail address of person responsible for this SDS : stephanie.massambi@constellium.com

1.4 Emergency telephone number

National advisory body/Poison Centre

Telephone number : Lyon: +33 (0) 4 72 11 69 11

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Product definition : Mixture

Classification according to Regulation (EC) No. 1272/2008 [CLP/GHS]

Skin Sens. 1, H317
Carc. 2, H351
STOT RE 2, H373
Aquatic Chronic 3, H412

The product is classified as hazardous according to Regulation (EC) 1272/2008 as amended.

See Section 16 for the full text of the H statements declared above.

SECTION 2: Hazards identification

See Section 11 for more detailed information on health effects and symptoms.

2.2 Label elements

Hazard pictograms



Signal word

: Warning

Hazard statements

: H317 - May cause an allergic skin reaction.
H351 - Suspected of causing cancer.
H373 - May cause damage to organs through prolonged or repeated exposure.
H412 - Harmful to aquatic life with long lasting effects.

Precautionary statements

Prevention

: P201 - Obtain special instructions before use.
P280 - Wear protective gloves: 4 - 8 hours (breakthrough time): Butyl rubber gloves. Nitrile gloves.. Wear protective clothing. Wear eye or face protection.
P273 - Avoid release to the environment.
P260 - Do not breathe dust.

Response

: P314 - Get medical advice/attention if you feel unwell.

Storage

: Not applicable.

Disposal

: P501 - Dispose of contents and container in accordance with all local, regional, national and international regulations.

Hazardous ingredients

: Nickel powder

Supplemental label elements

: Not applicable.

Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles

: Not applicable.

Special packaging requirements

Containers to be fitted with child-resistant fastenings

: Not applicable.

Tactile warning of danger

: Not applicable.

2.3 Other hazards

Product meets the criteria for PBT or vPvB according to Regulation (EC) No. 1907/2006, Annex XIII

: This mixture does not contain any substances that are assessed to be a PBT or a vPvB.

Other hazards which do not result in classification

: None known.

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SECTION 3: Composition/information on ingredients

3.2 Mixtures : Mixture

Product/ingredient name	Identifiers	%	Regulation (EC) No. 1272/2008 [CLP]	Type
Aluminium powder (pyrophoric)	REACH #: 01-2119529243-45 EC: 231-072-3 CAS: 7429-90-5 Index: 013-001-00-6	85 - 98.5	Pyr. Sol. 1, H250 Water-react. 1, H260	[2]
manganese	EC: 231-105-1 CAS: 7439-96-5	0 - 10	Eye Irrit. 2, H319 Aquatic Chronic 3, H412	[1] [2]
Nickel powder	EC: 231-111-4 CAS: 7440-02-0 Index: 028-002-01-4	0 - 10	Skin Sens. 1, H317 Carc. 2, H351 STOT RE 1, H372 Aquatic Chronic 3, H412	[1] [2]
copper	EC: 231-159-6 CAS: 7440-50-8	0 - 10	Aquatic Chronic 2, H411	[1] [2]
Zirconium powder (pyrophoric)	REACH #: 01-2119490102-49 EC: 231-176-9 CAS: 7440-67-7 Index: 040-001-00-3	0 - 5	Pyr. Sol. 1, H250 Water-react. 1, H260	[6]
chromium	REACH #: 01-2119485652-31 EC: 231-157-5 CAS: 7440-47-3	0 - 10	Not classified.	[2]
vanadium	REACH #: 01-2119537418-34 EC: 231-171-1 CAS: 7440-62-2	0 - 10	Not classified.	[2]
silicon	REACH #: 01-2119535442-45 EC: 231-130-8 CAS: 7440-21-3	0 - 10	Not classified.	[2]
iron	EC: 231-096-4 CAS: 7439-89-6	0 - 10	Flam. Sol. 1, H228 Self-heat. 1, H251 See Section 16 for the full text of the H statements declared above.	[6]

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment, are PBTs, vPvBs or Substances of equivalent concern, or have been assigned a workplace exposure limit and hence require reporting in this section.

Type

[1] Substance classified with a health or environmental hazard

[2] Substance with a workplace exposure limit

[3] Substance meets the criteria for PBT according to Regulation (EC) No. 1907/2006, Annex XIII

[4] Substance meets the criteria for vPvB according to Regulation (EC) No. 1907/2006, Annex XIII

[5] Substance of equivalent concern

[6] Additional disclosure due to company policy

Occupational exposure limits, if available, are listed in Section 8.

SECTION 4: First aid measures

4.1 Description of first aid measures

- Eye contact** : Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Get medical attention.
- Inhalation** : Remove victim to fresh air and keep at rest in a position comfortable for breathing. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.
- Skin contact** : Wash with plenty of soap and water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 10 minutes. Get medical attention. In the event of any complaints or symptoms, avoid further exposure. Wash clothing before reuse. Clean shoes thoroughly before reuse.
- Ingestion** : Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.
- Protection of first-aiders** : No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

4.2 Most important symptoms and effects, both acute and delayed

Over-exposure signs/symptoms

- Eye contact** : No specific data.
- Inhalation** : No specific data.
- Skin contact** : Adverse symptoms may include the following:
irritation
redness
- Ingestion** : No specific data.

4.3 Indication of any immediate medical attention and special treatment needed

- Notes to physician** : Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
- Specific treatments** : No specific treatment.

SECTION 5: Firefighting measures

5.1 Extinguishing media

- Suitable extinguishing media** : In case of fire, use special metal fire powder. Dry sand or other suitable absorbent.
- Unsuitable extinguishing media** : Do not use water or foam. Multi-purpose dry chemical (ABC). Carbon dioxide (CO₂).

SECTION 5: Firefighting measures

5.2 Special hazards arising from the substance or mixture

- Hazards from the substance or mixture** : This material is harmful to aquatic life with long lasting effects. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.
- Hazardous thermal decomposition products** : Decomposition products may include the following materials:
metal oxide/oxides

5.3 Advice for firefighters

- Special protective actions for fire-fighters** : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.
- Special protective equipment for fire-fighters** : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. Clothing for fire-fighters (including helmets, protective boots and gloves) conforming to European standard EN 469 will provide a basic level of protection for chemical incidents.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

- For non-emergency personnel** : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.
- For emergency responders** : If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

6.2 Environmental precautions

- : Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Water polluting material. May be harmful to the environment if released in large quantities.

6.3 Methods and material for containment and cleaning up

- Small spill** : Move containers from spill area. Avoid dust generation. Do not dry sweep. Vacuum dust with equipment fitted with a HEPA filter and place in a closed, labeled waste container. Place spilled material in a designated, labeled waste container. Dispose of via a licensed waste disposal contractor.
- Large spill** : Move containers from spill area. Approach the release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Avoid dust generation. Do not dry sweep. Vacuum dust with equipment fitted with a HEPA filter and place in a closed, labeled waste container. Dispose of via a licensed waste disposal contractor.

6.4 Reference to other sections

- : See Section 1 for emergency contact information.
See Section 8 for information on appropriate personal protective equipment.
See Section 13 for additional waste treatment information.

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SECTION 7: Handling and storage

7.1 Precautions for safe handling

- Protective measures** : Put on appropriate personal protective equipment (see Section 8). Persons with a history of skin sensitization problems should not be employed in any process in which this product is used. Avoid exposure - obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not get in eyes or on skin or clothing. Do not ingest. Avoid release to the environment. If during normal use the material presents a respiratory hazard, use only with adequate ventilation or wear appropriate respirator. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.
- Advice on general occupational hygiene** : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

7.2 Conditions for safe storage, including any incompatibilities

Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store locked up. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabelled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use.

7.3 Specific end use(s)

- Recommendations** : Not available.
- Industrial sector specific solutions** : Not available.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational exposure limits

Product/ingredient name	Exposure limit values
Aluminium powder (pyrophoric)	Ministry of Labor (France, 3/2020). Notes: Indicative limit values (circular) TWA: 10 mg/m ³ 8 hours. TWA: 5 mg/m ³ 8 hours. Form: Fume TWA: 5 mg/m ³ 8 hours. Form: powder
manganese	Ministry of Labor (France, 3/2020). Notes: Indicative regulatory limit values (decree of 30-06-2004 modified) TWA: 0.2 mg/m ³ , (as Mn) 8 hours. Form: Inhalable fraction TWA: 0.05 mg/m ³ , (as Mn) 8 hours. Form: Respirable fraction EU OEL (Europe, 10/2019). Notes: list of indicative occupational exposure limit values TWA: 0.2 mg/m ³ , ((as manganese)) 8 hours. Form: Inhalable fraction TWA: 0.05 mg/m ³ , ((as manganese)) 8 hours. Form: Respirable fraction
Nickel powder	Ministry of Labor (France, 3/2020). Notes: Indicative limit values (circular) TWA: 1 mg/m ³ 8 hours.
copper	Ministry of Labor (France, 3/2020). Notes: Indicative limit

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chromium	values (circular) TWA: 1 mg/m ³ , (as Cu) 8 hours. Form: Dust STEL: 2 mg/m ³ , (as Cu) 15 minutes. Form: Dust TWA: 0.2 mg/m ³ 8 hours. Form: Fume Ministry of Labor (France, 3/2020). Notes: Indicative regulatory limit values (decree of 30-06-2004 modified) TWA: 2 mg/m ³ 8 hours. EU OEL (Europe, 10/2019). Notes: list of indicative occupational exposure limit values TWA: 2 mg/m ³ 8 hours.
vanadium	Ministry of Labor (France, 3/2020). Notes: Indicative limit values (circular) TWA: 0.05 mg/m ³ , (as V ₂ O ₅) 8 hours. Form: Dust Ministry of Labor (France, 3/2020). Notes: Indicative limit values (circular) TWA: 10 mg/m ³ 8 hours.
silicon	

Recommended monitoring procedures : If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment. Reference should be made to monitoring standards, such as the following: European Standard EN 689 (Workplace atmospheres - Guidance for the assessment of exposure by inhalation to chemical agents for comparison with limit values and measurement strategy) European Standard EN 14042 (Workplace atmospheres - Guide for the application and use of procedures for the assessment of exposure to chemical and biological agents) European Standard EN 482 (Workplace atmospheres - General requirements for the performance of procedures for the measurement of chemical agents) Reference to national guidance documents for methods for the determination of hazardous substances will also be required.

DNELs/DMELs

Product/ingredient name	Type	Exposure	Value	Population	Effects
Aluminium powder (pyrophoric)	DNEL	Long term Inhalation	3.72 mg/m ³	Workers	Local
	DNEL	Long term Inhalation	3.72 mg/m ³	Workers	Systemic
	DNEL	Long term Oral	3.95 mg/kg bw/day	General population	Systemic
	DNEL	Long term Dermal	0.0021 mg/kg bw/day	General population	Systemic
	DNEL	Long term Dermal	0.00414 mg/kg bw/day	Workers	Systemic
	DNEL	Long term Inhalation	0.041 mg/m ³	General population	Systemic
manganese	DNEL	Long term Inhalation	0.2 mg/m ³	Workers	Systemic
	DNEL	Long term Inhalation	20 ng/m ³	General population	Local
	DNEL	Long term Inhalation	20 ng/m ³	General population	Systemic
	DNEL	Short term Oral	12 µg/kg bw/day	General population	Systemic
	DNEL	Long term Oral	0.02 mg/kg bw/day	General population	Systemic
	DNEL	Long term	0.05 mg/m ³	Workers	Local

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copper	DNEL	Inhalation Long term	0.05 mg/m ³	Workers	Systemic
	DNEL	Inhalation Short term	2.4 mg/m ³	General population	Local
	DNEL	Inhalation Short term	4 mg/m ³	Workers	Local
	DNEL	Inhalation Short term	408 mg/m ³	General population	Systemic
	DNEL	Inhalation Long term	0.035 mg/cm ²	General population	Local
	DNEL	Dermal Long term	0.035 mg/cm ²	Workers	Local
	DNEL	Short term	1 mg/m ³	General population	Local
	DNEL	Inhalation Long term	1 mg/m ³	General population	Local
	DNEL	Inhalation Short term	20 mg/m ³	General population	Systemic
	DNEL	Inhalation Short term	20 mg/m ³	Workers	Systemic
	DNEL	Inhalation Long term	137 mg/kg bw/day	General population	Systemic
	DNEL	Dermal Long term	137 mg/kg bw/day	Workers	Systemic
	DNEL	Dermal Short term	273 mg/kg bw/day	General population	Systemic
	DNEL	Dermal Short term	273 mg/kg bw/day	Workers	Systemic
Zirconium powder (pyrophoric)	DNEL	Inhalation Long term	2.5 mg/m ³	General population	Systemic
	DNEL	Inhalation Long term	5 mg/m ³	Workers	Systemic
	DNEL	Long term Oral	5.5 mg/kg bw/day	General population	Systemic
	DNEL	Dermal Long term	5.5 mg/kg bw/day	General population	Systemic
chromium	DNEL	Dermal Long term	11 mg/kg bw/day	Workers	Systemic
	DNEL	Inhalation Long term	0.027 mg/m ³	General population	Local
	DNEL	Inhalation Long term	0.5 mg/m ³	Workers	Local
	DNEL	Long term Oral	0.71 mg/kg bw/day	General population	Systemic
iron	DNEL	Long term	1.5 mg/m ³	General population	Local
	DNEL	Inhalation Long term	3 mg/m ³	Workers	Local

PNECs

No PNECs available

8.2 Exposure controls

SECTION 8: Exposure controls/personal protection

- Appropriate engineering controls** : If user operations generate dust, fumes, gas, vapour or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.
- Individual protection measures**
- Hygiene measures** : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Contaminated work clothing should not be allowed out of the workplace. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.
- Eye/face protection** : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: safety glasses with side-shields.
- Skin protection**
- Hand protection** : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated. 4 - 8 hours (breakthrough time): Butyl rubber gloves. Nitrile gloves.
- Body protection** : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
- Other skin protection** : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
- Respiratory protection** : Based on the hazard and potential for exposure, select a respirator that meets the appropriate standard or certification. Respirators must be used according to a respiratory protection program to ensure proper fitting, training, and other important aspects of use. Recommended: Filter type: P3
- Environmental exposure controls** : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance

- Physical state** : Solid. [Powder]
- Colour** : Silver. Greyish.
- Odour** : Odourless.
- Odour threshold** : Not available.
- pH** : Not available.
- Melting point/freezing point** : Not available.
- Initial boiling point and boiling range** : 2467°C
- Flash point** : Not available.

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SECTION 9: Physical and chemical properties

Evaporation rate	: Not available.
Flammability (solid, gas)	: Not available.
Upper/lower flammability or explosive limits	: EMI > 1000 mJ; dP/dt(max) 83 bar/s; P(max) 6.1 bar; Kst 22 bar.m/s; Dust explosion category (class) 1.
Vapour pressure	: Not available.
Vapour density	: Not available.
Relative density	: Not available.
Solubility(ies)	: Insoluble in the following materials: cold water and hot water.
Partition coefficient: n-octanol/ water	: Not available.
Auto-ignition temperature	: Not available.
Decomposition temperature	: Not available.
Viscosity	: Not available.
Explosive properties	: Not available.
Oxidising properties	: Not available.

9.2 Other information

Density	: 2.7 g/cm ³
Physical/chemical properties comments	: Particle size : 20-63 µm Based on available data, the classification criteria are not met. Not Flammable (UN N1 test) /Pyrophoric (UN N2 test) /Water-reactive material (UN N5 test).

SECTION 10: Stability and reactivity

10.1 Reactivity	: No specific test data related to reactivity available for this product or its ingredients.
10.2 Chemical stability	: The product is stable.
10.3 Possibility of hazardous reactions	: Under normal conditions of storage and use, hazardous reactions will not occur. Under normal conditions of storage and use, hazardous polymerisation will not occur.
10.4 Conditions to avoid	: Avoid melting wet or cold materials as molten metal may cause explosions in contact with water or wet surfaces. Suspensions of aluminum dust in air may pose a severe explosion hazard, especially in a confined atmosphere. Water hydrolyzes material liberating acidic gas which in contact with metal surfaces can generate flammable and/or explosive hydrogen gas.
10.5 Incompatible materials	: Reactive or incompatible with the following materials: oxidising materials, acids, alkalis and moisture. halogenated compounds
10.6 Hazardous decomposition products	: Under normal conditions of storage and use, hazardous decomposition products should not be produced.

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
manganese	LC50 Inhalation Dusts and mists	Rat	5.14 mg/l	4 hours
Nickel powder	LD50 Oral	Rat	9 g/kg	-
	LC50 Inhalation Dusts and mists	Rat - Male, Female	10.2 mg/l	1 hours
	LD50 Oral	Rat - Male, Female	>9000 mg/kg	-
copper	LC50 Inhalation Dusts and mists	Rat - Male, Female	>5.11 mg/l	4 hours
	LD50 Dermal	Rat - Male, Female	>2000 mg/kg	-
Zirconium powder (pyrophoric)	LD50 Oral	Rat - Female	>5000 mg/kg	-
vanadium	LD50 Oral	Rat - Female	>2000 mg/kg	-
silicon	LD50 Oral	Rat	3160 mg/kg	-
iron	LD50 Oral	Rat	30 g/kg	-

Conclusion/Summary : Not available.

Acute toxicity estimates

Product/ingredient name	Oral (mg/kg)	Dermal (mg/kg)	Inhalation (gases) (ppm)	Inhalation (vapours) (mg/l)	Inhalation (dusts and mists) (mg/l)
Aluminium powder alloys for selective laser melting with Nickel > 1%	19416.7	N/A	N/A	N/A	74.3
manganese	9000	N/A	N/A	N/A	5.14
Nickel powder	N/A	N/A	N/A	N/A	2.55
copper	500	N/A	N/A	N/A	N/A
silicon	3160	N/A	N/A	N/A	N/A
iron	30000	N/A	N/A	N/A	N/A

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
manganese	Eyes - Mild irritant	Rabbit	-	24 hours 500 mg	-
	Skin - Mild irritant	Rabbit	-	24 hours 500 mg	-
silicon	Eyes - Mild irritant	Rabbit	-	3 mg	-

Conclusion/Summary : Not available.

Sensitisation

Conclusion/Summary : Not available.

Mutagenicity

Conclusion/Summary : Not available.

Carcinogenicity

Conclusion/Summary : Not available.

Reproductive toxicity

Conclusion/Summary : Not available.

Teratogenicity

SECTION 11: Toxicological information

Conclusion/Summary : Not available.

Specific target organ toxicity (single exposure)

Not available.

Specific target organ toxicity (repeated exposure)

Product/ingredient name	Category	Route of exposure	Target organs
Nickel powder	Category 1	-	-

Aspiration hazard

Not available.

Information on likely routes of exposure : Routes of entry anticipated: Oral, Dermal, Inhalation.

Potential acute health effects

Eye contact : No known significant effects or critical hazards.
Inhalation : No known significant effects or critical hazards.
Skin contact : May cause an allergic skin reaction.
Ingestion : No known significant effects or critical hazards.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact : No specific data.
Inhalation : No specific data.
Skin contact : Adverse symptoms may include the following:
irritation
redness
Ingestion : No specific data.

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Short term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Long term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Potential chronic health effects

General : May cause damage to organs through prolonged or repeated exposure. Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.
Carcinogenicity : Suspected of causing cancer. Risk of cancer depends on duration and level of exposure.
Mutagenicity : No known significant effects or critical hazards.
Reproductive toxicity : No known significant effects or critical hazards.

Other information : Not available.

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SECTION 12: Ecological information

12.1 Toxicity

Product/ingredient name	Result	Species	Exposure
Aluminium powder (pyrophoric) manganese	Chronic NOEC 9 mg/l Fresh water	Aquatic plants - Ceratophyllum demersum	3 days
	Acute EC50 31000 µg/l Fresh water	Aquatic plants - Lemna minor	4 days
	Acute LC50 29000 µg/l Fresh water	Daphnia - Daphnia magna	48 hours
	Acute LC50 28 mg/l Fresh water	Fish - Pimephales promelas	96 hours
	Chronic NOEC 1.7 mg/l Fresh water	Daphnia - Water Flea- Ceriodaphnia dubia	8 days
Nickel powder copper	Chronic NOEC 100 mg/l Marine water	Algae - Glenodinium halli	72 hours
	Acute EC50 1100 µg/l Fresh water	Aquatic plants - Lemna minor	4 days
	Chronic NOEC 7 mg/l Fresh water	Aquatic plants - Ceratophyllum demersum	3 days
chromium	Acute EC50 0.2 ppm Marine water	Algae - Bacillariophyta	72 hours
	Acute EC50 5 ppm Marine water	Algae - Macrocystis pyrifera - Young	4 days
vanadium	Acute EC50 35000 µg/l Fresh water	Aquatic plants - Lemna minor	4 days
	Acute LC50 45 µg/l Fresh water	Crustaceans - Ceriodaphnia reticulata	48 hours
	Acute LC50 22 µg/l Fresh water	Daphnia - Daphnia magna	48 hours
	Acute LC50 13.9 ppm Fresh water	Fish - Anguilla rostrata	96 hours
	Chronic NOEC 50 mg/l Marine water	Algae - Glenodinium halli	72 hours
	Chronic NOEC 0.19 µg/l Fresh water	Fish - Cyprinus carpio	4 weeks
	Acute LC50 1550 µg/l Fresh water	Daphnia - Daphnia magna	48 hours
iron	Acute LC50 1.8 mg/l Fresh water	Fish - Pimephales promelas	96 hours
	Chronic NOEC 500 mg/l Marine water	Algae - Glenodinium halli	72 hours
	Chronic NOEC 100 mg/l Marine water	Algae - Glenodinium halli	72 hours

Conclusion/Summary : Not available.

12.2 Persistence and degradability

Conclusion/Summary : Not available.

12.3 Bioaccumulative potential

Product/ingredient name	LogP _{ow}	BCF	Potential
silicon	57 to 77	-	high

12.4 Mobility in soil

Soil/water partition coefficient (K_{oc}) : Not available.

Mobility : Not available.

12.5 Results of PBT and vPvB assessment

This mixture does not contain any substances that are assessed to be a PBT or a vPvB.

12.6 Other adverse effects : No known significant effects or critical hazards.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product

Methods of disposal : The generation of waste should be avoided or minimised wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction.

Hazardous waste : The classification of the product may meet the criteria for a hazardous waste.

Packaging

Methods of disposal : The generation of waste should be avoided or minimised wherever possible. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible.

Special precautions : This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers.

SECTION 14: Transport information

	ADR/RID	ADN	IMDG	IATA
14.1 UN number	Not regulated.	Not regulated.	Not regulated.	Not regulated.
14.2 UN proper shipping name	-	-	-	-
14.3 Transport hazard class(es)	-	-	-	-
14.4 Packing group	-	-	-	-
14.5 Environmental hazards	No.	No.	No.	No.

14.6 Special precautions for user : **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

14.7 Transport in bulk according to IMO instruments : Not available.

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SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

EU Regulation (EC) No. 1907/2006 (REACH)

Annex XIV - List of substances subject to authorisation

Annex XIV

None of the components are listed.

Substances of very high concern

None of the components are listed.

Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles

Ingredient name	EC number	CAS number	Restriction
nickel	231-111-4	7440-02-0	27

Label requirements : Not applicable.

Other EU regulations

Europe inventory : All components are listed or exempted.

Industrial emissions : Listed

(integrated pollution prevention and control) - Air

Industrial emissions : Listed

(integrated pollution prevention and control) - Water

Ozone depleting substances (1005/2009/EU)

Not listed.

Prior Informed Consent (PIC) (649/2012/EU)

Not listed.

Seveso Directive

This product is not controlled under the Seveso Directive.

National regulations

Product/ingredient name	List name	Name on list	Classification	Notes
nickel powder	France Occupational Exposure Limits	nickel (métal)	Carc. C2	-

Social Security Code, Articles L 461-1 to L 461-7 : vanadium
iron

RG 66

RG 44

Reinforced medical surveillance : Act of July 11, 1977 determining the list of activities which require reinforced medical surveillance: not applicable

International regulations

Chemical Weapon Convention List Schedules I, II & III Chemicals

Not listed.

Montreal Protocol

Not listed.

Stockholm Convention on Persistent Organic Pollutants

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SECTION 15: Regulatory information

Not listed.

Rotterdam Convention on Prior Informed Consent (PIC)

Not listed.

UNECE Aarhus Protocol on POPs and Heavy Metals

Not listed.

15.2 Chemical safety assessment

: This product contains substances for which Chemical Safety Assessments are still required.

15.3 Registration status

: Mixture. Information concerning the substance : Contact local supplier or distributor.

SECTION 16: Other information

Indicates information that has changed from previously issued version.

Abbreviations and acronyms

: ATE = Acute Toxicity Estimate
CLP = Classification, Labelling and Packaging Regulation [Regulation (EC) No. 1272/2008]
DMEL = Derived Minimal Effect Level
DNEL = Derived No Effect Level
EUH statement = CLP-specific Hazard statement
N/A = Not available
PBT = Persistent, Bioaccumulative and Toxic
PNEC = Predicted No Effect Concentration
RRN = REACH Registration Number
vPvB = Very Persistent and Very Bioaccumulative

Key literature references and sources for data

: Regulation (EC) No. 1272/2008 [CLP]; European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR), concluded in Geneva on 30 September 1957 plus amendments (Uniform text: Journal of Laws 27/2009 pos. 162 plus amendments); European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways (ADN); Occupational exposure limits; International regulations

Procedure used to derive the classification according to Regulation (EC) No. 1272/2008 [CLP/GHS]

Classification	Justification
Skin Sens. 1, H317 Carc. 2, H351 STOT RE 2, H373 Aquatic Chronic 3, H412	Calculation method Calculation method Calculation method Calculation method

Full text of abbreviated H statements

H228 H250 H251 H260	Flammable solid. Catches fire spontaneously if exposed to air. Self-heating: may catch fire. In contact with water releases flammable gases which may ignite spontaneously.
H302 H317 H319 H332 H351 H372	Harmful if swallowed. May cause an allergic skin reaction. Causes serious eye irritation. Harmful if inhaled. Suspected of causing cancer.
H373	Causes damage to organs through prolonged or repeated exposure. May cause damage to organs through prolonged or repeated

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SECTION 16: Other information

H411	exposure.
H412	Toxic to aquatic life with long lasting effects. Harmful to aquatic life with long lasting effects.

[Full text of classifications \[CLP/GHS\]](#)

Acute Tox. 4	ACUTE TOXICITY - Category 4
Aquatic Chronic 2	LONG-TERM (CHRONIC) AQUATIC HAZARD - Category 2
Aquatic Chronic 3	LONG-TERM (CHRONIC) AQUATIC HAZARD - Category 3
Carc. 2	CARCINOGENICITY - Category 2
Eye Irrit. 2	SERIOUS EYE DAMAGE/EYE IRRITATION - Category 2
Flam. Sol. 1	FLAMMABLE SOLIDS - Category 1
Pyr. Sol. 1	PYROPHORIC SOLIDS - Category 1
Self-heat. 1	SELF-HEATING SUBSTANCES AND MIXTURES - Category 1
Skin Sens. 1	SKIN SENSITISATION - Category 1
STOT RE 1	SPECIFIC TARGET ORGAN TOXICITY - REPEATED EXPOSURE - Category 1
STOT RE 2	SPECIFIC TARGET ORGAN TOXICITY - REPEATED EXPOSURE - Category 2
Water-react. 1	SUBSTANCES AND MIXTURES WHICH IN CONTACT WITH WATER EMIT FLAMMABLE GASES - Category 1

Training advice : Ensure operatives are trained to minimise exposures. Training staff on good practice.

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[Notice to reader](#)

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Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.